FIGURE 220AM
2-PIECE BALL VALVE

This instruction manual includes installation, operation, and maintenance information for Figure 220AM 2-piece ISO mount, 2000CWP (1/4”–1”) & 1500CWP (1-1/4”–3”), threaded end (NPT) ball valve.



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FIGURE 220AM
2-PIECE BALL VALVE

INSTALLATION

WARNING:

To avoid personal injury to yourself, fellow workers, or damage to property from release of process fluid, before installation:

- Shut off all operating lines to the valve site
- Isolate the valve site completely from the process
- Release process pressure
- Drain the process fluid from the valve site

1. Before installation, please make sure the marking on valve (such as pressure, flow direction, material, etc.) is in accordance with the application requirement.
2. Remove the protective plastic cap on both threaded ends, and clean or flush the valves.
3. Prior to mounting, flush and/or clean the pipeline to remove all accumulated extraneous matter, as this can cause damage to the seats and ball surface.
4. Use conventional sealant to seal threaded ends on the pipeline.
5. Apply pipe wrench on the hexagon end of valve only while tightening. Tightening by using the valve body or handle can seriously damage the valve.
6. After installation, make sure there is no stress left on the pipeline.

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FIGURE 220AM
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OPERATION

1. Prior to operation, make sure to clean and flush the whole pipeline completely.
2. The operation of the valve consists of turning the stem (by manual or automated means) 1/4 turn (90°) clockwise to close, and 1/4 turn counter-clockwise to open.
3. When the handle (if used) and/or stem flats or groove are in line with the pipeline, the valve is open.
4. Besides operating by handle, this FNW series also can operate by direct mounting with actuator on ISO5211 flange/plate.
5. Operating torque requirements will vary depending on the length of time between cycles, media in the system, line pressure and type of valve seat. The figures in the following table B are based on TFM4215 seats with clean water as the media.

Table A: Torque Figure for Stem Nut Tighten & Body-Cap Tighten

Valve Size		Stem Nut Tighten				Body-Cap Tighten	
NPS	DN	FNW220A, FNW221A		FNW220AM		in • lb	N • m
		in • lb	N • m	in • lb	N • m		
1/4	8	265	30	80 ~ 106	9 ~ 12	974 ~ 1150	110 ~ 130
3/8	10	265	30	80 ~ 106	9 ~ 12	974 ~ 1150	110 ~ 130
1/2	15	265	30	80 ~ 106	9 ~ 12	974 ~ 1150	110 ~ 130
3/4	20	353	40	80 ~ 106	9 ~ 12	1328 ~ 1593	150 ~ 180
1	25	574	65	106 ~ 142	12 ~ 16	1682 ~ 1947	190 ~ 220
1-1/4	32	574	65	106 ~ 142	12 ~ 16	2920 ~ 3186	330 ~ 360
1-1/2	40	971	110	151 ~ 195	17 ~ 22	3805 ~ 4160	430 ~ 470
2	50	971	110	151 ~ 195	17 ~ 22	4780 ~ 5310	540 ~ 600
2-1/2	65	971	110	221 ~ 283	25 ~ 32	6903 ~ 7346	780 ~ 830
3	80	971	110	221 ~ 283	25 ~ 32	9293 ~ 9824	1050 ~ 1100

Table B: Torque Valve

Size (NPS/ΔP)	75 PSIG		150 PSIG		300 PSIG		700 PSIG		1000 PSIG		1500 PSIG		2000 PSIG	
	5 bar		10 bar		20 bar		50 bar		63 bar		100 bar		130 bar	
	N • m	in • lb	N • m	in • lb	N • m	in • lb	N • m	in • lb	N • m	in • lb	N • m	in • lb	N • m	in • lb
1/4	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	7	62
3/8	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	7	62
1/2	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	6.5	57.5	7	62
3/4	7.8	69	7.8	69	7.8	69	7.8	69	7.8	69	7.8	69	8.4	74.3
1	13	115.1	13	115.1	14.3	126.6	14.3	126.6	14.3	126.6	14.3	126.6	16	141.6
1-1/4	16.9	149.6	16.9	149.6	19.5	172.6	24.7	195.6	24.7	218.6	26	230.1	-	-
1-1/2	24.7	218.6	24.7	218.6	28.6	253.1	33.8	276.1	33.8	299.1	37	327.5	-	-
2	35	309.8	35	309.8	38	336.3	45	354	45	398.3	45	398.3	-	-
2-1/2	52	460.2	60	531	65	575.3	83	663.8	83	734.6	91	805.4	-	-
3	85	752.3	90	796.5	95	840.8	115	1035.5	115	1017.8	125	1106.3	-	-

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FIGURE 220AM
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MAINTENANCE

Valve parts are subject to normal wear and must be inspected and replaced as necessary. Inspection and maintenance frequency depends on the severity of the service conditions. This section includes instructions for packing adjustments, repacking, seat replacement, and seating adjustment.

WARNING:

To avoid personal injury to yourself, fellow workers, or damage to property from release of process fluid, before installation:

- Shut off all operating lines to the valve site
- Isolate the valve site completely from the process
- Release process pressure
- Drain the process fluid from the valve site

Retighten Packing

For maximum stem packing life, proper packing adjustment procedure must be followed:

- Should a leakage occur at the gland packing, retighten the stem nut.
- Be careful to not tighten the stem nut too much. Normally the leakage can be stopped by simply turning the stem nut by 30° to 60°.

Replacement of Seats and Seals

Disassembly

1. Place the valve in a vise in the closed position. Do not over-tighten the vise or the valve may be deformed.
2. Remove the operator if one is installed.
3. Remove the stop-lock-cap, stem nut, belleville washers, and gland.
4. With a crescent or strap wrench, remove the end cap, seat, and the body gasket.
5. Remove the ball and seat.
6. Push the stem down through the body, and then remove the O-ring and thrust washer from the stem.
7. Remove the bushing and packing from the body.

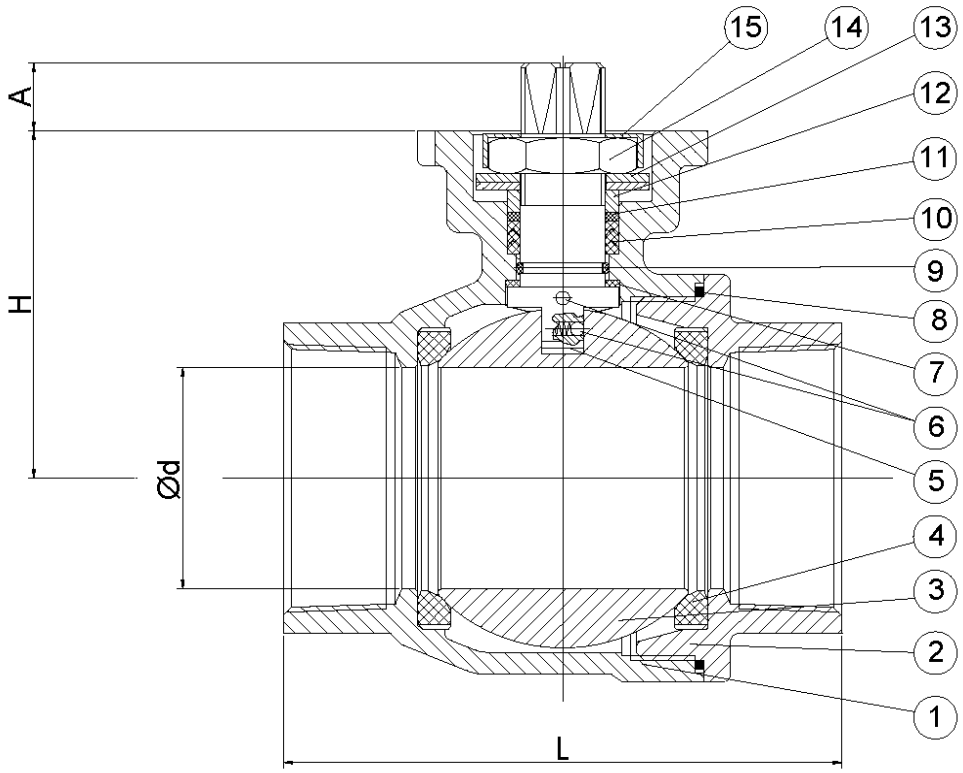
Reassembly

1. Clean and inspect all parts, full replacement of all soft parts (seats and seals) are strongly recommended.
2. Tighten the stem nut, using table A stipulated torque figure.
3. If possible, test the valve, then cycle valve several times before resuming service.

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FIGURE 220AM
2-PIECE BALL VALVE



Ref. No	Description	Material	Qty
1	Body	ASTM A351 Gr. CF8M Stainless	1
2	End Cap	ASTM A351 Gr. CF8M Stainless	1
3	Ball	316SS Stainless	1
4	Seat	TFM1600+20%GF	2
5	Stem	316SS Stainless	1
6	Anti-Static Device	316SS Stainless	2
7	Thrust Washer	TFM4215	1
8	Body Gasket	PTFE	1
9	O-Ring	FKM	1
10	V-Ring Packaging	PTFE	1 Set
11	Bushing	50% SS + 50% PTFE	1
12	Gland	316SS Stainless	1
13	Belleville Washer	301SS Stainless	2
14	Stem Nut	ASTM A194-8 Stainless	1
15	Stop-Lock-Cap	304SS Stainless	1

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FIGURE 220AM
2-PIECE BALL VALVE

WARRANTY

Limited Warranty

Subject to the limitations expressed herein, Seller warrants that products manufactured by Seller shall be free from defects in design, material and workmanship under normal use for a period of one (1) year from installation but in no case shall the warranty period extend longer than eighteen months from the date of sale. This warranty is void for any damage caused by misuse, abuse, neglect, acts of God, or improper installation. For the purpose of this section, “Normal Use” means in strict accordance with the installation, operation and maintenance manual. The warranty for all other products is provided by the original equipment manufacturer.

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Seller shall repair or replace, at its option, any non-conforming or otherwise defective product, upon receipt of notice from Buyer during the Manufacturer’s warranty period at no additional charge. SELLER HEREBY DISCLAIMS ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OR FITNESS FOR A PARTICULAR PURPOSE.

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Labor Allowance

Seller makes NO ADDITIONAL ALLOWANCE FOR THE LABOR OR EXPENSE OF REPAIRING OR REPLACING DEFECTIVE PRODUCTS OR WORKMANSHIP OR DAMAGE RESULTING FROM THE SAME.

Recommendations by Seller

Seller may assist Buyer in selection decisions by providing information regarding products that it manufacturers and those manufactured by others. However, Buyer acknowledges that Buyer ultimately chooses the product’s suitability for its particular use, as normally signified by the signature of Buyer’s technical representative. Any recommendations made by Seller concerning the use, design, application or operation of the products shall not be construed as representations or warranties, expressed or implied. Failure by Seller to make recommendations or give advice to Buyer shall not impose any liability upon Seller.

Excused Performance

Seller will make a good faith effort to complete delivery of the products as indicated by Seller in writing, but Seller assumes no responsibility or liability and will accept no back-charge for loss or damage due to delay or inability to deliver, caused by acts of God, war, labor difficulties, accidents, inability to obtain materials, delays of carriers, contractors or suppliers or any other causes of any kind whatever beyond the control of Seller. Under no circumstances shall Seller be liable for any special, consequential, incidental, or indirect damages, losses, or expense (whether or not based on negligence) arising directly or indirectly from delays or failure to give notice of delay.

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